CLAIMS

1. An inhibitor of human neutrophil elastase which is selected from the group consisting of EpiNEα, EpiNE1, EpiNE2, EpiNE3, EpiNE4, EpiNE5, EpiNE6, EpiNE7, EPINE8.

2. An inhibitor of human cathepsin G which is selected from the group consisting of EpiC1, EpiC7, EpiC8, EpiC10, EpiC20, EpiC31, EpiC32, EpiC33, EpiC34, and EpiC35.

3. An inhibitor of human neutrophil elastase which is selected from the group consisting of ITI-E7, BITI-E7, BITI-E7-1222, AMINO1, AMINO2, MUTP1, BITI-E7-141, MUTT26A, MUTQE, and MUT1619 in Table 220.

4. A homologous inhibitor of a reference inhibitor according to claims 1-3, said homologous inhibitor differing from said reference inhibitor by one or more substitutions of class A according to Table 65.

5. A homologous inhibitor of a reference inhibitor according to claims 1-3, said homologous inhibitor differing from said reference inhibitor by one or more substitutions of class A or B according to Table 65.

6. A homologous inhibitor of a reference inhibitor according to claims 1-3, said homologous inhibitor differing from said reference inhibitor by one or more substitutions of class A, B or C according to Table 65.

7. An inhibitor of human neutrophil elastase which is a compound having the formula of Figure 8, wherein

R_1 is hydrogen, L-prolyl, L,L cystinyl (i.e. NH_2-CH(CH_2-S-S-CH_2-CH(NH_2)-COOH)-CO-), L-valyl, other amino acids, or a carboxylic acid derivative having 2-8 carbons,

$R_2$is 2-propyl or secondary butyl,

Xis -CO-CH_2-, -CO-CFH-, -CO-CFH-CH_2-, -CO-CF_2-, -CO-CF_2-CH_2-, -B(OH)-CH_2-, -B(OR_7)-CH_2-, -SO-CH_2-, -CO-S, or -CO-CO-,

$R_3$is -H, -CH_3, -CH_2-COOH, or -CH_2-CH_2-COOH,

R4 is -CH_2-phenyl or -CH_2-CH_2-S-CH_3,

$R_5$is -CH_2-phenyl or other arylmethyl group,

$R_6$is -NH_2, -OH, or an additional N-linked amino acid, and

$R_7$is a small alkyl group.

8. An inhibitor of human neutrophil elastase which is a compound having the formula of Figure 9, wherein

R_1 is a relatively rigid bifunctional linker,

R_2 is 2-propyl or secondary butyl,

X is -CO-CH_2-, -CO-CFH-, -CO-CFH-CH_2-, -CO-CF_2-, -CO-CF_2-CH_2-, -B(OH)-CH_2-, -B(OR_7)-CH_2-, -SO-CH_2-, -CO-S, or -CO-CO-,

R_3 is -H, -CH_3, -CH_2-COOH, or -CH_2-CH_2-COOH,

R4 is -CH_2-phenyl or -CH_2-CH_2-S-CH_3,

$R_5$is -CH_2-phenyl or other arylmethyl group,

$R_6$is -NH_2, -OH, or an additional N-linked amino acid, and

$R_7$is a small alkyl group.

9. The inhibitor of claim 8 wherein R_1 is a tricyclic aromatic ring system having diametrically opposed functionalities one of which allows linkage to the amino group attached to C_7 and another that allows linkage to the carbonyl carbon labeled C_{11}.

10. The inhibitor of claim 9 wherein R_1 is 2-carboxymethyl-6-aminomethyl anthraquinone.

11. An inhibitor of human neutrophil elastase which is a compound having the formula of Figure 12, wherein

D1 and D2 are, independently, a hydroxyl group or a group that is capable of being hydrolyzed in aqueous solution to a hydroxyl

group at physiological conditions,

R_3 is -H, $-CH_3$, $-CH_2-COOH$, or $-CH_2-CH_2-COOH$,

$R_4$is $-CH_2$-phenyl or $-CH_2-CH_2-S-CH_3$,

$R_5$is $-CH_2$-phenyl or other arylmethyl group,

$R_6$is $-NH_2$, -OH, or an additional N-linked amino acid.

12. Use of an inhibitor according to any of claims 1-11 in the manufacture of a composition for the treatment or prophylaxis of a condition of the body caused by excessive neutrophil elastase activity.

13. Use of an inhibitor according to any of claims 1-11 in the manufacture of a composition for the treatment or prophylaxis of a condition of the body caused by excessive cathepsin G activity.

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